

In the Claims

Please amend the claims as follows:

Claims 1-67 (Canceled).

Please add new claims 68-87.

68. (New) A power supply connectable to an AC line voltage source for AC electric arc welding by an AC arc current across a gap between an electrode and a workpiece, said power supply comprising a high capacity transformer for converting said AC line voltage to an AC output voltage, a rectifier for converting said AC output voltage to a DC voltage between a positive terminal and a common terminal at substantially zero volts and a negative terminal and said common terminal, a first switch for connecting said positive terminal to said common terminal across said gap when a gate signal is applied to said first switch, a second switch for connecting said negative terminal to said common terminal across said gap when a gate signal is applied to said second switch, generating means for generating a gate signal of pulses at a given frequency, a first logic gate for directing said gate signal to said first switch for a first time, a second logic gate for directing said gate signal to said second switch for a second time, operating means for alternately operating said logic gates to create said AC arc current, a bidirectional, free wheeling circuit in parallel with said gap, and a center tapped inductor for reducing the ripple factor caused by said pulses, said inductor having a positive section, a negative section, and a center tap.

69. (New) A power supply as defined in claim 68, wherein said bidirectional free wheeling circuit includes a positive branch with a first control switch in parallel with a first free

wheeling diode and a first gate for controlling said first diode when a given logic appears on a positive steering line at said first gate and a negative branch with a second control switch in parallel
5 with a second free wheeling diode and a second gate for controlling said second diode when a given logic appears on a negative steering line at said second gate.

70. (New) A power supply as defined in claim 68, wherein said transformer is rated at least about 30 kW.

71. (New) A power supply as defined in claim 68, wherein said generating means adjusts said pulses to create an arc current of at least 1000 amperes.

72. (New) A power supply as defined in claim 68, wherein said given frequency is at least 18 kHz.

73. (New) A power supply as defined in claim 68, wherein said generating means includes a first input for controlling current amplitude by duty cycle of said pulses during the first time and a second input for controlling current amplitude by duty cycle of said pulse during said second time whereby said amplitudes are different.

74. (New) A power supply as defined in claim 69, wherein said transformer is rated at least about 30 kW.

75. (New) A power supply as defined in claim 74, wherein said generating means adjusts said pulses to create an arc current of at least 1000 amperes.

76. (New) A power supply as defined in claim 75, wherein said given frequency is at least 18 kHz.

77. (New) A power supply as defined in claim 76, wherein said generating means includes a first input for controlling current amplitude by duty cycle of said pulses during the first time and a second input for controlling current amplitude by duty cycle of said pulse during said second time whereby said amplitudes are different.

78. (New) A power supply connectable to an AC line voltage source for AC electric arc welding by an AC arc current across a gap between an electrode and a workpiece, said power supply comprising a high capacity transformer for converting said AC line voltage to an AC output voltage, a rectifier for converting said AC output voltage to a DC voltage between a positive terminal and a common terminal at substantially zero volts and a negative terminal and said common terminal, at least two large capacitors which are essentially equal for causing the voltage at said common terminal to be midway between the positive voltage at said positive terminal and the negative voltage at said negative terminal, a first switch for connecting said positive terminal to said common terminal across said gap when a gate signal is applied to said first switch, a second switch for

10 connecting aid negative terminal to said common terminal across said gap when a gate signal is applied to said second switch, generating means for generating a gate signal of pulses at a given frequency, a first logic gate for directing said gate signal to said first switch for a first time, a second logic gate for directing said gate signal to said second switch for a second time, operating means for alternately operating said logic gates to create said AC arc current, a bidirectional, free wheeling circuit in parallel with said gap, and a center tapped inductor for reducing the ripple factor caused by said pulses, said inductor having a position section, a negative section, and a center tap.

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79. (New) A power supply as defined in claim 78, wherein said bidirectional free wheeling circuit includes a positive branch with a first control switch in parallel with a first free wheeling diode and a first gate for controlling said first diode when a given logic appears on a positive steering line at said first gate and a negative branch with a second control switch in parallel with a second free wheeling diode and a second gate for controlling said second diode when a given logic appears on a negative steering line at said second gate.

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80. (New) A power supply as defined in claim 78, wherein said transformer is rated at least about 30 kW.

81. (New) A power supply as defined in claim 78, wherein said generating means adjusts said pulses to create an arc current of at least 1000 amperes.

82. (New) A power supply as defined in claim 78, wherein said given frequency is at least 18 kHz.

83. (New) A power supply as defined in claim 78, wherein said generating means includes a first input for controlling current amplitude by duty cycle of said pulses during the first time and a second input for controlling current amplitude by duty cycle of said pulse during said second time whereby said amplitudes are different.

84. (New) A power supply as defined in claim 79, wherein said transformer is rated at least about 30 kW.

85. (New) A power supply as defined in claim 84, wherein said generating means adjusts said pulses to create an arc current of at least 1000 amperes.

86. (New) A power supply as defined in claim 85, wherein said given frequency is at least 18 kHz.

87. (New) A power supply as defined in claim 86, wherein said generating means includes a first input for controlling current amplitude by duty cycle of said pulses during the first time and a second input for controlling current amplitude by duty cycle of said pulse during said second time whereby said amplitudes are different.